

SCISSOR LIFT RISK MANAGEMENT

Manufacturer : Jiangsu LiuGong Machinery Co.,Ltd

Machines covered are as detailed below.

Date 21/01/2025



Model	Safe Working Load	Maximum Platform Height	Maximum Lift Height Outdoors	Maximum Drive Height	Maximum Persons Indoor/ Outdoor	Total Mass
LSC0507DEM	240kg	4.5m	4.5m	4.5m	2/0	895kg
LSC0607DE	230kg	5.8m	5.8m	5.8m	2/1	1,540kg
LSC0808DE	230kg	8.0m	8.0m	8.0m	2/0	2,200kg
LSC0812DE	450kg	8.0m	8.0m	8.0m	2/1	2,640kg
LSC1012DE	350kg	10.0m	10.0m	10.0m	2/1	2,870kg
LSC1212DE	320kg	12.0m	7.5m	12.0m indoors	2/1	3,170kg
LS0507EM	240kg	4.5m	4.5m	4.5m	2/1	970kg
LS0608EM	230kg	5.8m	5.8m	5.8m	2/0	1,540kg

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Introduction

This report has been compiled with reference to Australian Occupational Health and Safety Legislation and details the risk assessment and hazards associated with the LiuGong Scissor Lifts as listed in the above table.

The risks pertain to the operation, maintenance, transportation and storage of the models listed, but does not cover the possible worksite specific hazards which will require a site specific risk assessment.

All models listed above have Australian Plant Design Registration from WorkSafe, and conform to AS/NZS1418.10. All models also have an operation and maintenance manual, which details the safe use and regular servicing required to maintain the machines listed, to a safe and reliable condition.

Our aim is to ensure all persons operating and those close by, as well as those connected with the use of the above models, are protected from, the hazards and risks associated with the use of the Mobile Elevating Work Platforms, through hazard controls such as Elimination, Substitution, Engineering, Administration. PPE should be worn as needed.

Control measures like decals fitted to the machine, literature provided and any education through training must be observed to reduce any residual risk. Replacing damaged, missing information in the form of decals and manuals must be done as required. All persons using the models above must be trained and competent in the safe use and be aware of the risks and hazards as laid out in this document. Regular maintenance must be done to ensure continued safe operation.

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Risk Analysis

Managing and reducing risks prevents incidents before they happen. For each hazard or hazardous situation, the severity of harm that could result should be estimated. Once severity and probability are estimated, controls can be put in place to lower the risk to either eliminate or reduce to an acceptable consequence.

Step 1.	Identify the Hazard	Examine the task and work area, spot dangers.
Step 2.	Identify the Risk	Determine the outcome of the hazard.
Step 3.	Assess the Risk	Evaluate the Likelihood and Consequences from the table.
Step 4.	Control the Risk	Eliminate, Substitute, Engineer, Administer, Wear PPE.
Step 5.	Document the Process	Record the hazard and how it was controlled, distribute.
Step 6.	Monitor and Review	Regularly check the progress and effectiveness.

	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	8 Medium	16 High	18 High	23 Critical	25 Critical
Likely	7 Medium	10 Medium	17 High	20 High	24 Critical
Possible	3 Low	9 Medium	12 Medium	19 High	22 High
Unlikely	2 Low	5 Low	11 Medium	14 Medium	21 High
Rare	1 Low	4 Low	6 Low	13 Medium	15 Medium

- Insignificant** first aid - bumps, bruising, band aid
- Minor** stitches, burns, treatment in outpatients
- Moderate** broken bones, hospitalisation, non permanent
- Major** minor amputation, extended stay in hospital, permanent injury
- Catastrophic** fatality, loss of major functionality, life changing event



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Hazard Type Checklist

LiuGong have identified the potential hazards associated with the use and maintenance of the models of equipment listed, the table below summarises both the hazard and outcome.

Table 1 Hazard Type Checklist	
CRUSHING, ENTANGLEMENT, CUTTING, SEVERING, STABBING, PUNCTURING, SHEARING, FRICTION, IMPACT, TRAPPING	<ul style="list-style-type: none"> - Can anyone's hair, clothing, gloves, cleaning apparatus or any other materials become entangled in moving parts, or objects in motion. - Can anyone be crushed due to: <ul style="list-style-type: none"> material falling from plant uncontrolled motion or unexpected movement of plant the plant tipping or rolling over inadequate slowing or stopping devices of plant to control movement support structure collapse being thrown from or under the plant coming in contact with moving parts of the plant during testing, inspection, operation, maintenance, cleaning or repair being trapped between the plant and materials or fixed structures - Cutting, stabbing & puncturing due to: <ul style="list-style-type: none"> contact with sharp or flying objects coming in contact with moving parts of the plant during testing, inspection, operation, maintenance, cleaning or repair of the plant parts of plant or worksite material disintegrating or falling movement of plant can anyone's body parts be sheared between moving parts or surfaces of the plant can anyone be burnt due to contact with moving parts or surfaces of the plant can anyone be struck by moving objects due to uncontrolled or unexpected movement of plant or work pieces (i.e. failure of the control system)
ERGONOMIC, SLIPPING, TRIPPING, FALLING	<ul style="list-style-type: none"> - Can anyone be injured due to: <ul style="list-style-type: none"> uneven or slippery work surfaces poor housekeeping in the vicinity of or in the plant obstacles being placed in the vicinity of the plant due to repetitive body movements constrained body posture or the need for excessive effort design inefficiency causing mental or psychological stress inadequate or poorly placed lighting of plant or workers in the working area lack of failsafe measures against human error or human action mismatch of plant with natural human limitations unhealthy posture or excessive efforts lack of personal fall protective equipment inadequate design/positioning of controls
HIGH PRESSURE FLUIDS, HIGH TEMPERATURES, FIRE/EXPLOSION	<ul style="list-style-type: none"> - Can anyone come into contact with fluids under high pressure, due to plant failure or misuse. - Can anyone come into contact with objects at high temperatures, or objects which can cause fire or burning. - Can anyone suffer illness due to exposure to high or low temperatures. - Can anyone be injured by explosion of gases, liquids, dusts or other substances triggered by the operation of the plant or material handled by the plant.

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Hazard Type Checklist

Table 1 - continued Hazard Type Checklist	
SUFFOCATION	- Can anyone be suffocated due to lack of oxygen, or atmospheric contamination.
ELECTRICAL	- Can anyone be injured by due to: the plant coming into contact with live conductors plant being too close to high tension power lines overload of electrical circuits damaged or poorly maintained electrical leads and cables damaged electrical switches water near electrical equipment lack of insulation against water contact shorting thermal radiation electrostatic radiation magnetic interference from workplace affecting electrical components
STABILITY	- Can machine tip or roll over due to stability system not extending. - Stability system failing structurally, mechanically, or retract unintentionally. - Control valve or interlock failure. - Setting up on soft ground, unlevel or uneven ground, excessive slope. - Driving on rough surfaces, over potholes, hitting fixed objects, excessive side loads, operation in excessive climatic conditions e.g. wind. - Uneven SWL weight distribution in the platform. - Attaching objects to handrails that could tip scissor lift, including banners and plaster plaster sheets. - Pushing hard on an external fixed object while inside of scissor lift, potentially pushing scissor lift over.
HYDRAULIC FAILURE	- Hydraulic system failure. - Check valve or relief valve failure. - Hose or cylinder failure - mechanical or fatigue.
STRUCTURAL FAILURE	- Structural failure due to fatigue, corrosion, or overloading. - Pin, cable or linkage failure. - General overload, lifting excessive load, loading platform/ basket in an unintended way.
MAINTENANCE	- Can anyone be injured: while carrying out routine, preventative or corrective maintenance. explosion due to an ignition source near charging battery adjusting equipment for essential components faulty or seized. operating a machine that has been damaged or modified operating a malfunctioning machine if the machines guards/covers are missing
TRANSPORT	- Can anyone be injured: due to machine instability while loading/unloading, transporting plant or objects falling from transport truck
OCCUPATIONAL HAZARDS	- Plant obstructing other plants at site. - Unauthorised use by untrained personnel. - Unintended use of duplicate controls while working. - Hearing loss or communication interference due to excessive noise. - Use of the plant as a crane . - Overloading of platform while elevated.

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Hazard Type Checklist

Table 1 - continued Hazard Type Checklist	
OTHER HAZARDS, EJECTION OF PARTS VIBRATION	<ul style="list-style-type: none"> - Can anyone be injured or suffer ill-health from exposure to: <ul style="list-style-type: none"> chemicals, toxic gases, fumes, dust, noise, vibration, radiation neurological and cardiovascular disorders from excessive vibration inadequate visibility road traffic inadequate means of access safe use of controls (speed of movement) failure of controls safety signs or decals removed energy supply failure (electrical or mechanical)

Hazard Control Measures

With the hazards now identified in Table 1, the following control measures have been put in place to reduce the risk to operators, occupants, maintenance persons, and those nearby. Below is a summary of potential hazards with the necessary control measures implemented.

Table 2 Hazard Control Measures					
HAZARD No.	HAZARD TYPE	LOCATION/ SCENARIO	Initial Risk Rating	CONTROL MEASURES TO REDUCE RISK	Residual Risk Rating
1	OCCUPATIONAL HAZARDS	General operation by an operator leads to an accident.	22 High	Comply with employer, job site and governmental rules. Read, understand and follow the instructions in the operators and safety manuals supplied with the plant, and adhere to decal instructions. Use good safe work practices in a commonsense way. Only have trained/certified operators, directed by informed and knowledgeable supervision, using the elevating work platform.	5 Low
2	WORKSITE HAZARDS	Failure to perform a jobsite risk assessment	20 High	A complete jobsite risk assessment should be performed prior to using the plant. To assist with this effort, Liugong provides an operation and maintenance manual which identifies most of the common residual risks for the plant. Every employer, user, and operator should review these residual risks and implement the necessary control measures to avoid them. Users and employers should also research other supplemental information regarding the safe use of the plant, to support this effort, such as work health and safety legislation.	4 Low
3	STRUCTURAL FAILURE	Failure of any structural component	22 High	The scissor lifts have undergone detailed structural analysis. These calculations take into consideration the machines expected operating configuration, envelope, and approved conditions.	5 Low

SCISSOR LIFT RISK MANAGEMENT

Hazard Control Measures

Table 2 - continued					
Hazard Control Measures					
HAZARD No.	HAZARD TYPE	LOCATION/ SCENARIO	Initial Risk Rating	CONTROL MEASURES TO REDUCE RISK	Residual Risk Rating
3 cont.	STRUCTURAL FAILURE	Failure of any structural component	22 High	Structural analysis takes into consideration a number of foreseeable forces including gravitational (based on rated capacity), dynamic, wind and manual forces.	5 Low
			22 High	Structural analysis is verified by physically testing the structural soundness through both static and dynamic loading.	5 Low
			22 High	All calculations, and verification, meets or exceeds the required structural safety factors of AS1418.10.	5 Low
4	STABILITY	Tip-over	24 Critical	All models listed have undergone detailed stability analysis. These calculations take into consideration the machines expected operating configuration, envelope, and approved operating conditions	15 Medium
			24 Critical	Stability analysis takes into consideration a number of foreseeable forces including gravitational (based on rated capacity), dynamic , wind and manual forces.	15 Medium
			24 Critical	Stability analysis not only evaluates the machines static condition, but also potential effects of dynamic conditions (i.e. braking, and depressions)	15 Medium
			24 Critical	Stability analysis is verified by physically testing the static and dynamic stability of the design.	15 Medium
			24 Critical	All calculations, and verification, meets or exceeds the required stability safety factors of AS1418.10.	15 Medium
		22 High	Plant drives onto terrain that exceeds allowable limits. All plants are equipped with a chassis inclination device which sounds an alarm when the terrain slope is approaching the allowable limits. Warnings about dangerous use are detailed in operators manual and on decals.	15 Medium	
		24 Critical	Trying to retract / extended outriggers when platform is elevated	If scissor lift is equipped with outriggers, scissor lift will prevent the platform from being elevated until the outriggers have been fully extended. The design will not allow the retraction of the outriggers until the platform has been completely stowed/lowered.	15 Medium
22 High	Driving too fast for the terrain conditions	When the platform on the plant is elevated, the drive speed is reduced. Proportional drive is provided. Brakes provided to control scissor lift speed downhill.	15 Medium		
5	STABILITY, COLLISION	Loss of braking while travelling	22 High	Brakes on all scissor plants automatically engage when the power to them has stopped or failed. Brakes are capable of holding the plant on approved slopes.	15 Medium

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Hazard Control Measures

Table 2—continued
Hazard Control Measures

HAZARD No.	HAZARD TYPE	LOCATION/ SCENARIO	Initial Risk Rating	CONTROL MEASURES TO REDUCE RISK	Residual Risk Rating
5 Continued	STABILITY, COLLISION	Plant moves too quickly when platform is elevated	22 High	The drive speed of the scissor lift is reduced and restricted, once the platform is elevated, in accordance with AS1418.10	15 Medium
		Plant does not stop quickly enough	22 High	The scissor lift stopping distance at maximum speed meets or exceeds the requirements of AS 1418.10. Control positions on the plant are located and designed to allow excellent visibility and to allow slow, deliberate movements to prevent contact with adjacent objects. The scissor lift can be fitted with secondary guarding for overhead and pedestrian protection based on risk assessment of work in tight overhead areas.	15 Medium
6	STABILITY, STRUCTURAL FAILURE	Overloading platform	22 High	The scissor lift is equipped with a load-sensing system which protects the scissor lift and operator from reaching a point where the platform can be operated when the platform is overloaded.	15 Medium
		Tip-over	24 Critical	To help avoid overturning of the scissor lift the machine is equipped with pot hole protection which automatically deploys. Do not exceed maximum allowable manual side force, as displayed in operators manual and decals.	15 Medium
7	STABILITY, HYDRAULIC FAILURE	Platform elevated and hydraulics fail	24 Critical	Lift cylinder solenoid valve is protected from hose failure, with a counterbalance valve.	15 Medium
8	CRUSHING, ENTANGLEMENT, CUTTING, SEVERING, STABBING, PUNCTURING, SHEARING, IMPACT	General operation	22 High	Operators manual warns operator to keep personnel clear of scissor pack, alarm sounds on descent. Kick boards are placed around platform to prevent objects falling from platform. Strobe lights fitted to warn bystanders. The scissor lift can be fitted with secondary guarding for overhead and pedestrian protection based on risk assessment of work in tight overhead areas. No sharp edges on scissor lift, smooth edges where operator would hold or touch.	15 Medium

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Hazard Control Measures

Table 2 - continued

Hazard Control Measures

HAZARD No.	HAZARD TYPE	LOCATION/ SCENARIO	Initial Risk Rating	CONTROL MEASURES TO REDUCE RISK	Residual Risk Rating
9	TRAPPING, CUTTING, SEVERING, SHEARING	General operation	16 High	Trapping and shearing points between moving parts which are within reach of persons on the work platform or standing adjacent to the plant at ground level are avoided by providing safe clearances in accordance with AS 4024.1801, AS 1802 or AS 1803 or guarding in accordance with AS 4024.1601 as applicable.	4 Low
10	MAINTENANCE, CRUSHING, SEVERING, SHEARING	General maintenance and operation	19 High	A scissor stack mechanical safety arm is provided to hold the structure in a fixed position. The platform must only be lowered when there are no obstructions, obstacles or people in the area below both the extension platform or main platform.	13 Medium
11	HIGH TEMPERATURES	General operation	10 Medium	The electric motor is positioned away from control positions and cables are insulated.	4 Low
12	FIRE/ EXPLOSION	General operation	9 Medium	Each battery is positioned and designed such that dangerous accumulations of gases do not occur in places occupied by operators.	4 Low
		General maintenance	9 Medium	The filling points for flammable hydraulic fluid are positioned ergonomically, to minimize the risk of fire from spillage onto hot parts or live electrical equipment.	4 Low
13	CHEMICAL BURN, FIRE/ EXPLOSION, EJECTION OF PARTS	General operation	19 High	The battery, or batteries, are constrained to prevent unintentional displacement, or ejection of electrolyte, even in an overturning event.	6 Low
14	COLLISION	Unintended platform movement	24 Critical	The scissor lift is designed to prevent any inadvertent movements of the extending structure or drive system. Trained operators should only use the scissor lift.	15 Medium
		Falling from transport trailer/truck	20 High	Use correct tie down points and equipment as directed in Chain of Responsibility guidance. (CoR) Correct procedure detailed in operators manual.	6 Low
		Falling from height when scissor lift, lifted	25 Critical	Use correct lifting points as directed in operators manual and as described on decals. Ensure decals are readable and replaced when required. Ensure lifting points are serviceable before use.	15 Medium

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Hazard Control Measures

Table 2 - continued

Hazard Control Measures

HAZARD No.	HAZARD TYPE	LOCATION/ SCENARIO	Initial Risk Rating	CONTROL MEASURES TO REDUCE RISK	Residual Risk Rating
15	HYDRAULIC FAILURE	Overloading the structure and drive system.	24 Critical	Load limiting devices are provided to protect the extending structure, and drive system, to prevent structural damage.	15 Medium
		Unintended platform movement	24 Critical	A hydraulic valving is provided to prevent the platform from unintentionally lowering. When power to the controls stop or fails, this system automatically locks the work platforms movements, in any position.	15 Medium
16	Falls	Falling from platform	22 High	Scissor lift is fitted with guard rails and gate as required by AS/NZS1418.10. Gate is self closing and latching. Three points of contact are available for persons entering or exiting scissor lift. Non slip flooring is provided for persons in platform and on steps.	15 Medium
17	OCCUPATIONAL HAZARDS	Unauthorised use	22 High	All scissor lifts are equipped with a key switch to prevent unauthorised use. Additionally only one control panel can be operated at any given time.	15 Medium
18	Electrocution	Working close to power lines	19 High	Working near powerlines must be done only by competent persons after risk assessment. Follow directions on decal for safe approach distances, do not work within safe distances to live power lines. Scissor lift is not insulated, must stay safe distance from power lines. Decal on scissor lift must be readable.	6 Low
		Battery charger use	12 Medium	Battery charger requires 240VAC from a circuit protected source, with surge protection. Battery charger is an appliance that requires a test and tag regularly. Do not dismantle or change battery charger or inlet. Only use correctly tested and tagged inlet that is not visibly damaged or has water ingress.	6 Low

Prioritising Product Safety

The information provided in this document is only a small example of the activities which have been undertaken by Liugong Industries to ensure the safety of the plants. These include:

- Performing computer simulation/modeling of product and internal design calculations.
- Independent design review by an independent engineer to local design requirements is completed in Australia.
- Cycle testing of components to ensure fatigue life is adequate before 10 year life is completed.
- Extensive field testing of prototype units to ensure faults and hazards are identified before design is finalised.
- Conducting an extensive Product Development Process, on each plant design, which incorporates risk assessment and field testing to prove the plant design is safe to use, by a trained and authorised operator, for its intended purpose.

Legislation

ACT, NSW, QLD:

Work Health and Safety Act 2011

NT:

Work Health and Safety Act 2011 (National Uniform Legislation)

SA,TAS:

Work Health and Safety Act 2012

VIC:

Occupational Health and Safety Act 2004 (OHS Act)

WA:

Work Health and Safety Act 2020

